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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,365	09/10/2003	Bradley J. Aitchison	11429/12:2	5483

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EXAMINER	
GREENE, JASON M	

ART UNIT	PAPER NUMBER
1724	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/660,365	AITCHISON ET AL.	
	Examiner	Art Unit	
	Jason M. Greene	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *37-42* is/are withdrawn from consideration.

5)☒ Claim(s) *1-28* is/are allowed.

6)☒ Claim(s) *29-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2.2/04;4/04;~~13/04~~.* 10/22/06
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-36, in the reply filed on 9 November 2005 is acknowledged.

Claims

2. Claim 11 recites at least one high efficiency particle filter being positioned downstream from the high efficiency particle filter in lines 1-3. However, it appears as though the claim should read as at least one high efficiency particle filter being positioned downstream from the high **conductivity** particle filter since the claim does not previously recite the system having a high efficiency particle filter. The Examiner suggests Applicants amend the claim accordingly.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 29-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kesala (US 2001/0042523 A1) in view of Pang et al. (US 6,193,802 B1).

With regard to claim 29, Kesala teaches a method of delivering pulses of a precursor vapor to a reaction space in a thin film deposition system comprising providing a supply of precursor material (13), establishing a flow path (the unnumbered process lines) from the precursor material to the reaction space (60), vaporizing at least a portion of the precursor material to form a precursor vapor (see paragraph [0012]), selectively releasing pulses of the precursor vapor through the flow path and toward the reaction space (using valves 8 and actuators 9), and filtering the precursor vapor, including directing the precursor vapor through a filter (6) comprising a mechanical filter, a ceramic molecular sieve or an electrostatic filter in Figs. 1 and 2 and paragraphs [0012] and [0024] to [0061].

Kesala does not teach the filtering of the precursor vapor including directing the precursor vapor through a filter passage having multiple turns, at least one of the turns being positioned in proximity to an inertial trap so that inertia of particles carried into the filter passage by the precursor vapor causes the particles to travel into the trap as the precursor vapor travels through said turn.

Pang et al. teaches a teaches a method of delivering a precursor vapor to a reaction space in a thin film deposition system comprising providing a supply of precursor material (not shown, source of deposition material connected to line 18, see

col. 7, lines 36-48), establishing a flow path (the unnumbered process lines) from the precursor material to the reaction space (10), providing a precursor vapor, and filtering the precursor vapor exhausted from the reaction space, including directing the precursor vapor through a filter passage (54) having multiple turns, at least one of the turns being positioned in proximity to an inertial trap (62, see col. 12, lines 21-35) so that inertia of particles carried into the filter passage by the precursor vapor causes the particles to travel into the trap as the precursor vapor travels through said turn in Figs. 1, 3, 4(a) and 4(b) and col. 7, line 21 to col. 12, line 50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the precursor vapor exhaust filtering of Pang et al. into the method of Kesala to reduce the amount of unreacted precursor vapor released from the reaction space, as suggested by Pang et al. in col. 8, lines 28-44.

The step of filtering the precursor vapor recited in step 29 has not been interpreted as limiting the filtering to the precursor vapor between the supply of precursor material and the reaction space. However, the Examiner notes that adding such a limitation to claim 29 would be sufficient to overcome this rejection.

With regard to claims 30-36, Kesala discloses the vaporizing of the precursor material including heating the supply of precursor material, storing the supply of precursor material (13) in a precursor container (11) and drawing a vacuum inside the precursor container (inside vacuum vessel 1), the drawing of the vacuum inside the precursor container being accomplished via a vacuum flow path the bypasses the

reaction space (the venture and air pump shown in Fig .2), filtering (6) particles from the vacuum flow path, establishing a staging volume (7) that is selectively isolatable from the supply of precursor material and the reaction space, wherein the pulses of precursor vapor are released by a pulse valve (8), and further comprising providing a controlled backflow of inert gas (nitrogen) in the gas flow path downstream from the pulse valve to prevent leakage from the pulse valve from reaching the reaction space when the pulse valve is closed, and wherein the system is an ALD system in paragraphs [0007] to [0061].

Allowable Subject Matter

5. Claims 1-28 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 1-28, Kesala (US 2001/0042523 A1) teaches a precursor delivery system for delivering pulses of vaporized precursor material to a reaction space in a thin film deposition system comprising a precursor container (11) for holding a supply (13) of precursor material, a flow path (the unnumbered process lines) from the precursor material to the reaction space (60), a pulse control device (valves 8 and actuators 9) disposed between the precursor container and the reaction space, the

pulse control device adapted to selectively release pulses of the precursor material toward the reaction space via the flow path, and a particulate filter (6) interposed in the flow path between the precursor container and the reaction space, the particulate filter being a mechanical filter, a ceramic molecular sieve or an electrostatic filter in Figs. 1 and 2 and paragraphs [0024] to [0061].

Pang et al. (US 6,193,802 B1) teaches a teaches a precursor delivery system for delivering vaporized precursor material to a reaction space in a thin film deposition system comprising a precursor container (not shown, source of deposition material connected to line 18, see col. 7, lines 36-48) for holding a supply of precursor material, a flow path (the unnumbered process lines) from the precursor material to the reaction space (10), and a high conductivity particulate filter (40) disposed in an exhaust path of the reaction space, the high conductivity particle filter including at least one inertial trap (62, see col. 12, lines 21-35) adjacent the flow path (54) for filtering particles from the precursor material exhausted from the reaction space without significantly restricting flow through the flow path in Figs. 1, 3, 4(a) and 4(b) and col. 7, line 21 to col. 12, line 50.

However, Pang et al. is directed to a continuous CVD system and does not teach the system comprising a pulse control device disposed between the precursor container and the reaction space, the pulse control device adapted to selectively release pulses of the precursor material toward the reaction space via the flow path. Also, Pang et al. teaches the high conductivity particulate filter being disposed in an exhaust path of the reaction space and not interposed in the flow path between the precursor container and

the reaction space. Furthermore, since Pang et al. is directed to a CVD system and teaches the high conductivity particle filter being disposed downstream the reaction chamber, there is no motivation to substitute the filter of Pang et al. for the filter of Kesala.

Falabella et al. discloses a precursor delivery system for delivering vaporized precursor material to a reaction space in a thin film deposition system comprising a cathode arc ion source (20), a flow path (housing 13 and extension 28) from the precursor material to the reaction space (11), and a high conductivity particulate filter (baffles 29) interposed in the flow path between the ion source and the reaction space, the high conductivity particle filter including at least one inertial trap (the gap between baffles 29) adjacent the flow path for filtering particles from the precursor material without significantly restricting flow through the flow path in Fig. 1 and col. 4, line 52 to col. 5, line 46.

However, Falabella et al. is directed to a cathode arc ion source for providing plasma to a reaction space and does not teach the system comprising a precursor container for holding a supply of precursor material or a pulse control device disposed between the precursor container and the reaction space, the pulse control device adapted to selectively release pulses of the precursor material toward the reaction space via the flow path. Furthermore, since Falabella et al. is directed to a cathode arc ion source for providing a continuous flow of plasma to a reaction chamber, there is no motivation to incorporate the filter of Falabella et al. into the system of Kesala.

Conclusion

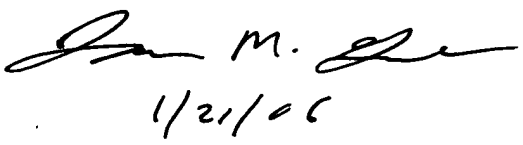
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Guenther, Tanaka et al., Potkay, Foster, Shero et al., Lei, Gorokhovsky, and Seidel et al. references disclose similar systems..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Greene
Examiner
Art Unit 1724



1/21/06

jmg
January 21, 2006